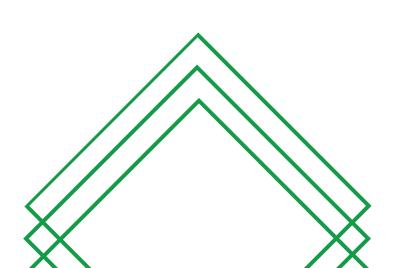


September 2024

Electrification in Motion

An Update on New York City's Electric For-Hire Vehicle Fleet





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Letter from the Chair

Dear New Yorkers,

In October 2023, the City of New York and the Taxi & Limousine Commission adopted the landmark Green Rides Initiative to reduce emissions and improve accessibility across the city's for-hire vehicle fleet. Green Rides requires high-volume companies like Uber and Lyft to dispatch all trips to either zero-emission vehicles or wheelchair-accessible vehicles (WAVs) by 2030. Meeting this ambitious requirement will take a sustained effort from TLC and its partners over the next several years, but in sharing this new report on our progress so far, I'm happy to say we are ahead of schedule: as of August 2024, almost 20% of high-volume trips were conducted in either an electric vehicle or WAV, far exceeding the year's target of 5%. More than 14 million EV trips in 2024 so far have saved a combined 19,000 metric tons of CO₂ emissions, equivalent to the emissions associated with powering nearly 3,800 homes for a full year. With more than 10,000 TLC-licensed EVs now on the road, we wanted to analyze the impact of electrification on drivers and riders and collect our insights in a report so that they may be a resource for others across the industry.

In TLC's work to electrify our licensed fleet, we've faced challenges new and old. Following TLC's Green Rides announcement and the issuance of new EV-only vehicle licenses, the agency saw an unprecedented surge in applications from drivers interested in ditching costly lease arrangements for the chance to license an EV. This influx of thousands of applications posed a challenge to TLC's licensing and inspections staff and —as I witnessed while out talking to drivers at charging sites across the city on cold January days—put a strain on our infrastructure. But these hurdles also strengthened our resolve to get the industry working together to electrify. TLC convened a task force that met with state and local government partners, equipment manufacturers, charging technology providers, utilities, industry associations, and for-hire vehicles bases to enhance charging access for licensees and reduce congestion at charging sites. To help drivers learn about their charging options, TLC shared resources at our inspection facility and at charging hubs, as well as through a new dedicated page on the TLC website.

At TLC, we take pride in our ability to adapt and ensure New Yorkers can benefit from a safe, reliable for-hire vehicle industry. I'm proud to see so many stakeholders working together to aid this critical transition in our industry. And Green Rides is just getting started. TLC's commitment to an electrified fleet is not just about reducing emissions; it's about creating a cleaner, safer, and more livable city for all.

David Do

Chair and Commissioner

Executive Summary

As part of its Green Rides Initiative, the New York City Taxi & Limousine Commission (TLC) has committed to ensuring that 100% of trips by high-volume for-hire vehicle bases like Uber and Lyft in New York City are dispatched to electric vehicles (EVs) or wheelchair accessible vehicles (WAVs) by 2030.

Green Rides is a central pillar of TLC's plans to reduce emissions through fleet electrification, which were laid out in *Charged Up!*, the agency's electrification roadmap released in 2022.¹ This report, *Electrification in Motion: An Update on New York City's Electric For-Hire Vehicle Fleet*, details the agency's progress over the last two years toward meeting its electrification goals following the issuance of new electric for-hire vehicle licenses.²

Although a court order halted the application process, thousands of drivers obtained EV-only licenses and started performing trips between November 2023 and April 2024. This report analyzes the performance of EVs in the for-hire vehicle industry and discusses how TLC, its partners, and driver networks are working together to address challenges around charging access in the aftermath of the drastic increase in EV licenses. Finally, the report identifies lessons learned for future efforts to reduce emissions and meet the Green Rides Initiative targets.

Exploring the EV transition through TLC's data

TLC analyzed the vast data it collects on for-hire vehicle trips to assess the state of the EV transition. This data includes information on the makeup of the EV fleet, trip activity and trip volume, passenger fares, trip distance, the geographical distribution of trips, as well as driver pay. By identifying new trends and analyzing continuities in the data between January 2023 and June 2024, TLC can assess how policy changes affect industry operations as well as the experience of drivers and passengers.

^{[1] &}quot;Charged Up! Report 2022," NYC TLC.

EV trip activity is higher in Queens, home to many of the city's larger charging sites.

Most EV trips happen in Manhattan, where most of all types of trips happen. However, Queens sees a higher proportion of EV trips: 24% of the city's EV trips are in the borough, while only 20% of trips in all other vehicles occur in Queens. The Bronx, on the other hand, sees 12.4% of gas-powered FHV trips but only 10.5% of trips in electric FHVs. This discrepancy may be due to the wider availability of charging in Queens relative to the city in general and to the Bronx in particular, which has the fewest fast-charger hubs of the five boroughs.

Utilization of electric FHVs is increasing as drivers learn to charge more efficiently, and EV trips are longer on average.

For-hire EVs dispatched by Uber and Lyft completed 263 more trip miles in June 2024 than in January 2023, compared to an increase of only 43 trip miles for the average gas-powered vehicle in the same period. EVs are also completing more trips: the average for-hire EV performed 24 more trips in June 2024 than in January 2023, while gas-powered vehicles performed three fewer trips on average.

The share of trips in an EV went from 2% to more than 11% in the months following TLC's issuance of new EV-only for-hire vehicle licenses.

Since the EV license application window is now closed, TLC expects that the EV share of high-volume trips will remain relatively steady in the short term. Any increase will be the result of drivers who already hold for-hire vehicles licenses deciding to replace their gaspowered vehicles with EVs.

Trends in charger utilization and infrastructure development

This report also documents developments in the city's charging infrastructure over the last two years, explores how TLC-licensed drivers are charging their vehicles, and analyzes the impact of new electric for-hire vehicles on public charging stations. To get a better understanding of trends in charging utilization, TLC collected data from charging providers such as the New York City Department of Transportation (NYC DOT), the New York Power Authority (NYPA), Tesla, and Revel. TLC will continue to work with charging providers to expand charging options and close gaps in the city's charging network.

Drivers of TLC-licensed EVs prefer to charge at the beginning or end of their days, as opposed to mid-shift.

This finding was backed up by driver surveys and TLC's analysis of vehicle location data, which revealed that drivers often log-on for the first time each day in the vicinity of large fast-charger hubs³, such as those at JFK Airport and the Queens Center Mall.

Charger utilization has increased markedly across the city's charging network.

A TLC survey revealed that about two-thirds of new EV drivers planned to primarily use public chargers. One charging provider saw an 800% increase in charging activity at their sites since September 2023. NYC DOT reported one very highly utilized charger in Jackson Heights, Queens has a vehicle plugged in 98% of the time. Increased charging demand has ushered in more infrastructure investment by both the public and private sectors. However, high utilization has also led to congestion and long lines at key hubs.

Charging gaps remain, especially in the Bronx, but more charging is coming.

Revel and Tesla are actively working to add hundreds of stalls to their charging networks. NYC DOT has ambitious plans to expand Level 2 charging options and is working with NYPA to bring up to 13 new fast-charger hubs online, including in the Bronx..

Supporting partners to bring more charging online

TLC has limited capacity to provide charging infrastructure beyond what can be installed at its facilities, such as the 30 fast chargers slated for installation as part of the redevelopment of its Woodside inspection facility. But the agency continues to work closely with charging providers to plan new sites that can benefit TLC-licensed drivers. By providing trip data and publishing an interactive map of driver residence data,⁴ charging providers can more effectively site charging so that it is convenient for the growing ranks of TLC-licensed EV drivers.

Lessons learned from TLC's electrification efforts

Congestion at charging sites has fallen as drivers have gotten better at managing their charging needs and charging availability has improved. However, there remains a high need for more charging. The long development process of up to 18 months continues to be a hurdle. Stronger collaboration between utilities, developers, landowners, and builders is needed to keep up with demand.

Because TLC drivers are routinely picking up or dropping off passengers at the city's airports, EV chargers at those locations were destined to play an important role in facilitating the EV transition. Facing limited alternatives, very high utilization at airport chargers has strained the capacity and equipment at those sites. The Port Authority of New York and New Jersey (Port Authority), NYPA, the NYC Economic Development Corporation (NYC EDC), and others are working to get more charging built at the region's airports, though these sites often present unique challenges around issues like utility upgrades and power sharing for airport operations.

TLC will continue analyzing data to understand how EV adoption is changing the industry. Monitoring trends in accessible vehicle licensing and emissions savings will be especially important as a larger share of the fleet is electrified. TLC is exploring ways to continue improving WAV service citywide, including by implementing stricter wait-time benchmarks for accessible for-hire service and improving data reporting on the experience of wheelchair users across the fleet.

Introduction

The New York City Taxi & Limousine Commission (TLC) is committed to ensuring that 100% of trips dispatched by high-volume for-hire vehicle (FHV) services, such as Uber and Lyft, are conducted in either electric vehicles (EV) or wheelchair accessible vehicles (WAV) by 2030.

This requirement was adopted by the Commission in October 2023 as part of the agency's Green Rides Initiative to reduce emissions and improve accessibility. Shortly after adoption and to advance this goal, TLC opened applications for EV-only vehicle licenses. Thousands of drivers applied for TLC plates which, to many driver-owners,⁵ provide a surer path to economic security than the vehicle leasing arrangements found throughout the industry. Though a court order halted the application process after just a few weeks, TLC processed thousands of new EV-only FHV licenses from late 2023 into early 2024, significantly expanding the number of EVs in the FHV fleet in only a few months.

This report documents changes in the industry since TLC published Charged Up!, its 2022 electrification roadmap that paved the way for the Green Rides Initiative.⁶ The Green Rides requirements address sustainability and accessibility goals together, and TLC has seen consistent growth in the number of accessible FHV trips over the last two years.⁷ TLC already publishes regular reports on FHV accessibility,⁸ so this report focuses on fleet electrification now that over 10,000 TLC-licensed EVs are on the road. Accordingly, this report analyzes trends in EV infrastructure development, incentives for EV drivers and charging providers, and the performance of EVs in the for-hire industry.

The report also discusses how TLC, its partners, and driver networks are working together to address challenges around charging access in the aftermath of the drastic increase in EV licenses. Finally, the report identifies lessons learned for future efforts to meet the goals of the Green Rides Initiative.

As of July, more than 14 million electric FHV trips in 2024 have saved more than 19,000 metric tons of CO₂ emissions compared to if those same trips were completed in gaspowered vehicles. Paired with TLC's efforts to introduce EVs to other sectors—such as the Battery Electric Vehicle Taxi Pilot Program, which led to the inclusion of battery-electric EV models on the list of approved vehicles that can be put in service as taxis—electrification is well underway throughout the industry. The analyses in this report have been informed by engagement with interested industry groups and partner agency groups, such as the New York City Department of Transportation (NYC DOT), Con Edison, New York Power Authority (NYPA), Tesla, and Uber. Understanding the challenges and successes thus far will allow TLC and its partners to build on this progress and deliver a cleaner and more accessible for-hire fleet.

^[9] Based on TLC data. Net of emissions associated with EV charging, using fleet-weighted average fuel economy and EV charging efficiencies from EPA. Estimated emissions from EV charging based on NYSERDA's short-run CO₂ emissions factors for the downstate grid averaged over the first six months of 2024.

Evolving Policy & Industry Context

The EV landscape in New York has changed considerably since TLC published its *Charged Up!* report in 2022. New and expanded incentive programs have made it possible to build charging more easily and cheaply. Maturation of the electric vehicle market and widely available incentives for buyers have helped make EVs more competitive on cost compared to gas-powered alternatives. Policy and regulatory moves by TLC, the City, and various levels of government have taken advantage of this momentum, the benefits of which are starting to be seen across the region.

TLC's recent efforts to facilitate the EV transition

The first Green Rides Initiative target came into effect in 2024 and sets a benchmark of five percent of all high-volume (i.e., Uber and Lyft) trips dispatched to zero-emission or wheelchair accessible vehicles. The benchmarks then rise to 15% in 2025 and 25% in 2026. The 2027 target is 40% and increases yearly by 20% until 2030, when all trips must be performed in either a WAV or EV (see Figure 1).

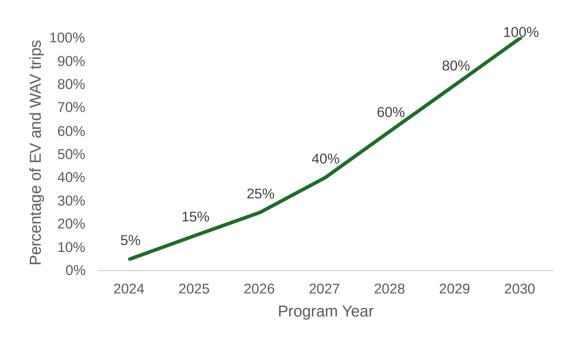


Figure 1: Green Rides Initiative Timeline

In conjunction with the announcement of the Green Rides Initiative, TLC opened license applications for EV licenses in October 2023. Up until that point, WAVs were the only vehicle type consistently available for new license applications since the license pause was implemented in 2018.

After the application window opened, TLC initially received about 100-200 applications per day. A lawsuit led to a court-ordered pause in applications. Instead of allowing drivers to transition to new vehicles at their own pace, the limited period for applications resulted in a rush on licenses, with several thousand submitted over a matter of days. Since TLC vehicle license applications require a vehicle identification number or VIN at the time of application, drivers rushed to dealerships to purchase cars with little time for planning. More than 9,700 applications were submitted ahead of the deadline, far more than anticipated. Of the applications that ultimately received licenses, roughly nine in ten went to individual drivers.

In the following months, new EVs went through the TLC inspection facility and joined the for-hire fleet. To address the challenges introduced by the large number of EVs hitting the road, TLC conducted outreach to assist new EV owners with their charging needs and worked with its partners to understand barriers to charging and brainstorm solutions.

Convening an EV charging task force

In early 2024, TLC convened an inter-departmental task force to identify opportunities to enhance charging access for licensees and reduce congestion at key charging sites. The task force met with utilities, partners in state and local government, equipment manufacturers, charging technology providers, industry associations, and FHV bases. In meetings with TLC staff, charging stakeholders shared new cross-industry partnerships to bolster charging access for licensees, including the driver incentive programs and subsidies for at-home charging equipment detailed in the next section.

TLC's outreach to EV drivers

Transitioning to an EV from a gas-powered vehicle can present some obstacles, particularly in the colder months in New York when many new EV drivers began making trips. TLC staff, led by the Office of Community Affairs, visited five charging sites across the city to hear directly from EV drivers. These conversations helped identify challenges, but they also underscored the benefits new EV-only licenses brought to drivers, including the opportunity to own their own vehicle.

To help drivers learn about their new vehicle and develop charging plans, TLC staff provided resources at high-activity areas like airports and at its Woodside, Queens, inspection facility. Staff shared information on charger locations and provided guidance on how to install at-home charging. TLC also sent EV-related communications via text and email and provided links to other resources on the TLC website.¹¹

Newly licensed EV drivers were largely unfamiliar with the array of charging options available throughout the city, and few were versed in charging best practices, such as preconditioning or ending a session once the battery reaches 90%. The influx also came during the winter months, which contributed to the long lines seen at certain popular charging stations. At very cold temperatures, EV batteries have been found to drain faster and not charge as fast. Testing on 18 EV models done by Recurrent Auto found that, on average, during cold weather vehicles only had 70% of their range. During a string of especially cold days in January 2024, methods to avoid range loss, such as preconditioning the car, were shared with drivers through social media and the TLC website.

New and expanded incentives for TLC licensees and charging providers

Even though the number of EVs in the TLC-licensed fleet has increased rapidly since the Green Rides Initiative was announced, a persistent challenge is balancing driver concerns about charging availability with developers' due diligence around infrastructure investments. Just as the upfront cost of EVs can deter potential buyers, the high cost of installing charging when demand may be uncertain can be a drag on both public and private sector investment.

The Charged Up! report documented a growing pool of incentives available to drivers interested in buying EVs and to firms trying to rationalize investments in chargers. These resources were foundational to making the policy objectives of the Green Rides Initiative feasible. The last few years have seen new and expanded incentive programs, summarized in the tables below. These incentives demonstrate the sustained commitment to electrification by utilities and various levels of government. As discussed further, incentive programs are directly supporting plans for charging tailored to FHV drivers.

Infrastructure and business incentives

Governments and utilities have expanded their infrastructure incentives over the last two years (see Table 1). These incentives include direct rebates for charging equipment, makeready funds that help offset the costs associated with electrical upgrades at charging sites, and utility programs that provide operating cost support. The expansion plans of key charging providers in the five boroughs, including the New York Power Authority (NYPA), have been made possible through utility incentive programs. New incentives for commercial charging operators, such as Con Edison's PowerReady and SmartCharge Commercial programs lower site development and operating costs for charging providers and encourage efficient demand management. As of July 2024, the PowerReady program has nearly \$22 million in make-ready incentives committed for completed fast-charger projects or projects slated to be completed in the near term in New York City. 14

Table 1: New and expanded infrastructure and operating incentives

Program	Support Granted	Qualifying Entities
New York State Dept. of Environmental Conservation ZEV Infrastructure Grant (program expanded) ¹⁵	Rebates up to \$375,000 and grants up to \$500,000 for purchase and installation of public EV charging infrastructure	Municipalities
NYSERDA Charge Ready NY 2.0 ¹⁶	\$2,000 per charging port at a workplace or multi- unit dwelling location; \$4,000 per charging port at a public facility within a DAC	Entities that install L2 EV charging stations
Consolidated Edison (Con Edison) Make Ready Program ¹⁷	Up to 50-100% of L2 and fast-charger installation costs covered including electrical infrastructure upgrades	Public or private entities installing EV charging stations
Con Edison SmartCharge Commercial Program ¹⁸	Cash rewards for avoiding charging during local 4-hour high grid demand window, and for charging overnight	Public or private commercial EV charging operators, including fleet, public hub, apartment building and curbside
Con Edison Demand Charge Rebate ¹⁹	50% off applicable demand delivery charges for public fast charging stations	Operators of publicly accessible fast-chargers

^{[13] &}quot;Con Edison expands SmartCharge EV incentive program to commercial stations in NYC," UtilityDive.

^[14] Data provided by Con Edison to TLC, July 2024.

^{[15]&}quot;Zero Emission Vehicle (ZEV) Rebate and ZEV Fueling Infrastructure Grant for Municipalities," US Department of Energy.

^{[16] &}quot;Charge Ready NY 2.0," NYSERDA.

^{[17]&}quot;EV Make-Ready Program," Joint Utilities of New York.

^{[18] &}quot;Con Edison Launches First-of-Its-Kind Managed Charging Rewards Program for Commercial Operators," Con Edison.

^{[19] &}quot;Demand Charge Rebate," Con Edison.

Many new infrastructure incentive programs are designed to channel investment toward disadvantaged communities (DACs). A New York State climate working group created the DAC designation to guide state-led climate actions, aiming to direct funding to areas most threatened by climate change due to existing burdens and vulnerabilities that accumulate over time due to poor planning and inequitable distribution of public resources. The criteria for DAC designation include multiple environmental burdens and health vulnerabilities, intended to identify communities at disproportionate risk for adverse effects of climate change.²⁰

Figure 2 demonstrates that zip codes with high a proportion of TLC-licensed drivers often have a DAC designation. Efforts like the New York State Energy Research and Development Authority's (NYSERDA) Charge Ready NY 2.0 and Con Edison's PowerReady make-ready program provide significantly higher incentives for investments in DACs, which can result in charging projects that make sense from both a network planning perspective—providing access to charging in areas where TLC drivers live and work—and an environmental justice perspective.

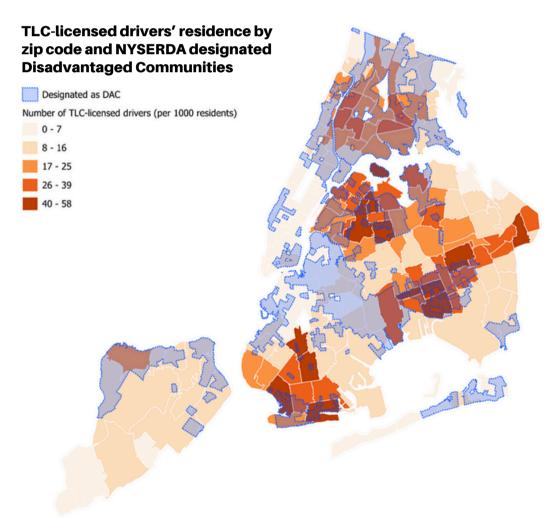


Figure 2: Map of Driver Residence by Zip Code and DAC

Incentives for electric vehicles and at-home charging

For drivers, programs to offset the costs of purchasing a vehicle and installing at-home charging continue to be widely available. Both the state and federal government continue to offer rebates, worth several thousand dollars depending on the vehicle, for the purchase of EVs.²¹ In addition to providing operational incentives for drivers providing trips in EVs, such as the charging discounts and per-trip bonuses discussed below, platforms like Uber are also providing rebates for at-home charger installation through partnerships with manufacturers.²² Uber has also worked to expand EVs by offering drivers up to \$2,000 toward a vehicle in partnership with carmakers and dealerships. These rebates, paired with time-of-use charging discounts and cash bonuses available through Con Edison's SmartCharge New York program, help make charging at home easy and less expensive for drivers with access to off-street parking.²³

Industry partnerships encouraging progress toward EV targets

New cross-industry partnerships have helped make driving an EV economically sustainable for TLC licensees. For example, Uber has partnerships with TrueCar, AutoNation, and General Motors to provide incentives of up to \$2,000 when drivers purchase an EV through the partnership program and perform a certain number of trips in the vehicle on Uber's platform.²⁴

In addition to cash incentives, high-volume FHV dispatchers and charging providers have worked together to offer discounts on charging. Charging discounts for Uber and Lyft drivers available through national charging networks like EVgo and Electrify America, both of which operate charging sites in the New York City metro area.²⁵ Through Uber's program, drivers can save up to 45% off at EVgo charging stations and up to 25% off at Revel EV charging stations.

TLC has worked with charging firms to develop and market discounts to its licensees. For example, TLC has worked with NYPA to recruit drivers to its EVolveNY charging rewards pilot program. Since its inception at the start of 2024, nearly 400 drivers have signed up to receive exclusive discounts at NYPA's fast-charger sites. NYPA is planning to build on this early success and expand the program through the end of the year. TLC has also publicized incentives available to drivers through Con Edison's SmartCharge New York program, which provides charging discounts and cash bonuses for participants that charge their vehicle during off-peak hours. As of mid-2024, around 2,000 drivers of TLC-licensed vehicles are enrolled and receiving discounts through the program.²⁶

^{[21] &}quot;Credits for new clean vehicles purchased in 2023 or after," IRS.

^{[22] &}quot;Drivers using Uber can save on Level 2 home charging with Wallbox," Wallbox.

^{[23] &}quot;Time-of-Use Rates," Con Edison.

^{[24] &}quot;Together on the road to zero emissions," Uber.

^{[25] &}quot;Electrify America discount," Lyft; "Program Benefits," Uber.

^{[26] &}quot;SmartCharge New York program details," Con Edison. Data on driver enrollment provided by Con Edison.

Managing lines at charging stations

To help better manage demand and charging availability, TLC has also worked with local charging provider Revel to publicize time- and site-specific discounts at under-utilized charging stations to relieve congestion at other nodes in the network.

Drivers also have also used communication apps, such as WhatsApp, to address congestion at charging stations. Through these informal chats, drivers can form a virtual queue, keeping track of who is next in line to charge without physically being at the stations, as a method to maximize utilization at chargers and minimize lines at stations.

TLC's conversations with stakeholders revealed that the industry widely recognizes the importance of TLC drivers as a source of charging demand, central to rationalizing further investments in EV infrastructure. Drivers can expect charging incentives and other partnerships to continue growing as more charging comes online.

Exploring the Fleet Transition through TLC's Data

In the months since the Green Rides Initiative was announced and newly licensed EVs hit the road, TLC has collected a wealth of data on the fleet transition, the operational performance of new vehicles, and the impacts of electrification on driver pay, trip volume, and vehicle availability. In 2024, EVs are performing trips of all types, in every neighborhood of the city, and providing drivers the reliability and cost savings they need to earn a living.

Fleet makeup today

Drivers in the for-hire industry can license most kinds of vehicles. So far, about 7,400 TLC drivers have chosen Tesla vehicles (see Table 2). There are over 6,300 Tesla Model Y hatchback SUVs on the road, followed by the company's slightly less expensive Model 3 sedan with 1,469 vehicles.

Make	Model	Vehicles
Tesla	Model Y	6,355
Tesla	Model 3	1,469
Toyota	bZ4X	846
Kia	Niro EV	424
Cadillac	LYRIQ	184
Hyundai	IONIQ 5	153
Nissan	LEAF	139
Volkswagen	ID.4	131
Ford	Mustang Mach-E	115
Tesla	Model S	110
All other makes and models		823

Table 2: Count of Electric FHVs by Make and Model (as of July 2024)

Tesla's Model Y and Model 3 remain a popular EV choice in the US generally, but the company's market dominance has diminished in recent years. At the end of Q1 2024, Tesla held 51% of the EV market share in the US, which was down from 79% in 2020.²⁷ As of July 2024, Tesla vehicles make up over three-quarters of the NYC electric for-hire fleet. Brand familiarity likely explains Tesla's outperformance compared to other manufacturers in the city's electric FHV market. The short timeline drivers faced when deciding to purchase and license an electric FHV may have led many to choose the company they most closely associated with EVs. However, TLC drivers' longstanding loyalty to Toyota can be seen in the outperformance of the bZ4X, the brand's only fully electric vehicle, in the electric FHV fleet. During its first year on the market, the bZ4X captured about 1% of the 2023 US EV market share, a position it maintained through the end of Q1 2024.²⁸ As of April 2024, Toyota's bZ4X is the third most popular electric vehicle in the FHV fleet, making up about 8% of the electric fleet.

Trip activity

Most newly licensed EVs passed inspection and started making trips between November 2023 and April 2024. Since the license application window is now closed, the number of EV trips and their share of total trips is expected to remain relatively steady after the rapid increase when these new vehicles first hit the road (Figure 3). Rather than from new licenses, short-term growth in the EV trip share will come from vehicle turnover.

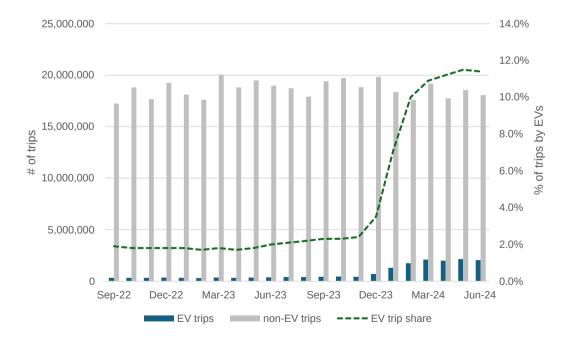


Figure 3: High-Volume EV and non-EV Trips

Passenger Fares in High-Volume For-Hire EVs

Passenger fares are consistently higher in high-volume for-hire EVs than gas-powered FHVs (Figure 4). To encourage the transition to EVs, high-volume FHV companies have provided incentives to EV drivers. Around 5.6% of EV trips dispatched by Uber are part of their luxury service compared to 3.9% of trips in gas-powered vehicles.²⁹ The Tesla Model Y, by far the most common EV. qualifies for Uber Black. Premium services like Uber Black have higher passenger fares and compensate drivers more.

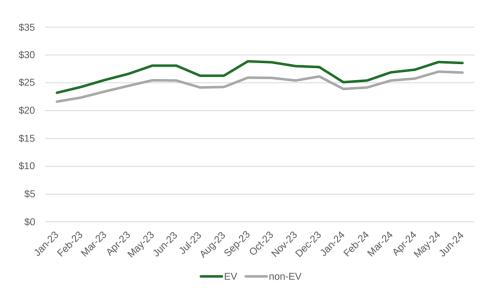


Figure 4: Average Passenger Fares for High-Volume FHV Trips

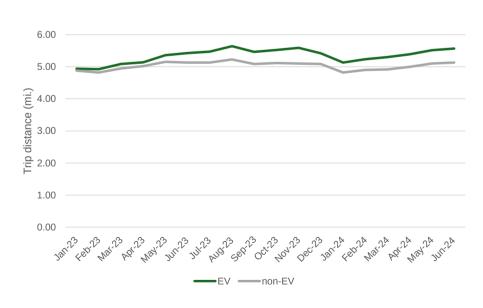


Figure 5: Average High-Volume FHV Trip Distance

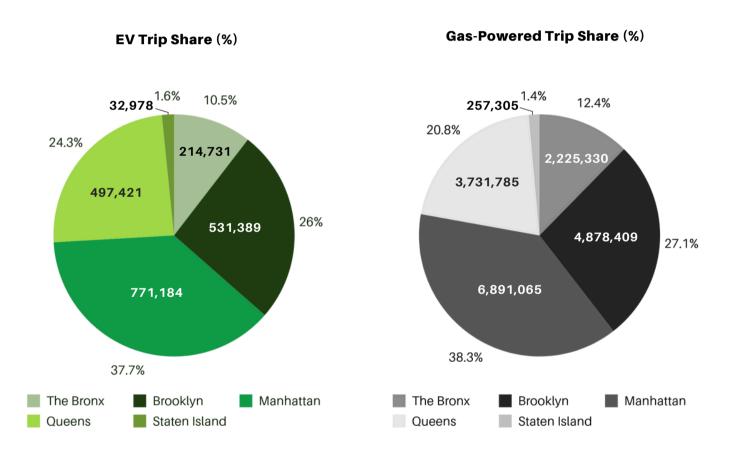
Average trip distance in High-Volume For-Hire EVs

On average, EVs make longer trips than gas-powered vehicles, but the difference is only about half a mile (Figure 5). EV trips are longer in part because a larger share of EV trips start at area airports. In June 2024, 4.7% of EV trips started at an airport compared to 3.8% of trips in gaspowered vehicles. While the difference is slight, airport pickups add around nine miles to a trip on average. Higher airport activity among electric FHVs may be due to greater availability of chargers in neighborhoods around airports compared to the rest of the city.

Geographic Distribution of High-Volume EV Trips

EVs perform about 11% of all high-volume FHV trips in NYC, but these trips are not evenly distributed across the city. Figure 6 maps the share of all high-volume pickups in an EV by taxi zone and includes current fast-charger locations. While EVs are clearly making a higher proportion of pickups in areas of outer Queens and Staten Island, those neighborhoods have lower trip volumes overall (Table 3). Most trips are in Manhattan, where about 38% of all EV trips originate. At the borough level, the share of trips occurring in Queens is slightly higher than the share of trips in gas-powered vehicle, while the EV share in the Bronx is lower.

Figure 6: June 2024 High-Volume FHV Trip Counts by Borough



Total: 2,047,703 Total: 17,983,894

The prevalence of EV trips outside Manhattan and neighborhoods of Brooklyn and Queens close to the central business district may result from charging patterns. Queens, for example, is home to several larger charging hubs. It may also be the product of higher EV adoption among drivers who live in neighborhoods where off-street parking makes charging at home feasible. Fewer EV trips in the Bronx likely reflects a lack of fast-charger access in that borough. However, the higher EV trip share in taxi zones along the northern and western edges of the borough suggests some drivers are traveling outside the city, likely to Westchester County, to charge their vehicles. As the charging network expands, the EV trip distribution will likely trend toward areas of the city where trip activity is typically high.

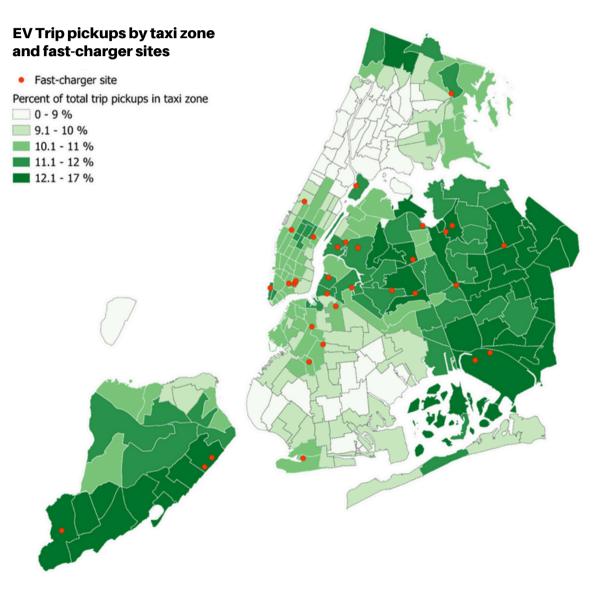


Figure 7: High-Volume EV Pickups and Fast-Charger Locations

Driver pay and costs

TLC's ongoing analysis of costs associated with EVs is crucial to assessing the feasibility of reaching electrification goals and balancing the benefits of electrification and emissions reduction with the burden placed on drivers and FHV companies. While EVs are often more expensive to purchase than gas-powered vehicles, studies show that they have lower ongoing maintenance and refueling costs.³¹

According to Edmunds, in the first quarter of 2024, the average EV sold in the US was 42% more expensive than the average gas-powered vehicle.32 A TLC analysis of common vehicles and their market prices at local dealerships found a smaller price difference among the most popular makemodels in the FHV fleet. The fleet-weighted average market price among the ten most popular electric FHVs in a standard configuration was about \$45,400 compared to \$36,200 for the ten most popular gas-powered vehicles, a difference of 25%.33 A TLC-sponsored survey of more than 2,000 owner-drivers confirmed that those with EVs paid around 25% more to acquire their vehicle than those with gas-powered vehicles, though the median acquisitions cost reported by drivers of both vehicle types was higher than the base-model market prices quoted online.34

State and federal incentives available to EV buyers at the point of sale reduce the sticker price of EVs by up to \$9,500. These incentives narrow the gap between common electric and gas-powered forhire vehicles, particularly for the base configuration in the current model year.

Outside of the luxury Tesla Model Y and the longer-range Toyota bZ4x, EVs with a retail price at or below \$40,000 that have become more common in the TLClicensed fleet over the last two years include the Nissan LEAF, Hyundai IONIQ, Kia Niro, and Volkswagen ID.4. TLC expects the acquisitions costs of EVs to fall as new, lower cost models become more widely available and as the used market for EVs becomes more robust. However, given the importance of lower vehicle costs to meeting TLC's transition timeline, the agency will continue to monitor trends in vehicle prices and the availability of incentives, which are critical to making EVs cost competitive in the medium term.³⁵ Should the price gap between EVs and gas-powered vehicles widen, TLC will work with its partners to identify strategies for reducing costs, encouraging drivers to continue making the switch and remaining on track to hit the Green Rides targets.

^{[31] &}quot;Battery-Electric Vehicles Have Lower Scheduled Maintenance Costs than Other Light-Duty Vehicles," Office of Energy Efficiency & Renewable Energy.

^{[32] &}quot;Big Gap Remains in Average Price of Electric Car vs. Gas Car," Edmunds.

^[33] Based on TLC analysis of Kelley Blue Book quotes for fair prices at dealerships in NYC as of July 2024. Analysis conducted for latest model year of ten most common make-models for both electric and gas-powered FHVs and assumed standard configurations. See: "New Car Prices," Kelley Blue Book.

^[34] The 25% difference between fuel types is based on inflation-adjusted dollars; the median EV was purchased in 2023 while the median gas-powered vehicle was purchased in 2021. Vehicle acquisition costs reported by drivers may be higher due to drivers opting for upgraded configurations.

Monthly Average Driver Pay per Trip

For-hire EV drivers' average monthly pay per trip is consistently higher compared to those in gas-powered vehicles (see Figure 8). One contributor to this disparity is the platform incentives mentioned above: Uber currently offers EV drivers an extra \$210 after completing 200 rides in an EV every 30 days. In the first half of 2024, Uber paid over \$6.5million in bonuses to drivers in New York City who have transitioned to using EVs on its platform.³⁶ As discussed above, EVs are more commonly eligible for premium services like Uber Black, which may also contribute to higher driver pay.

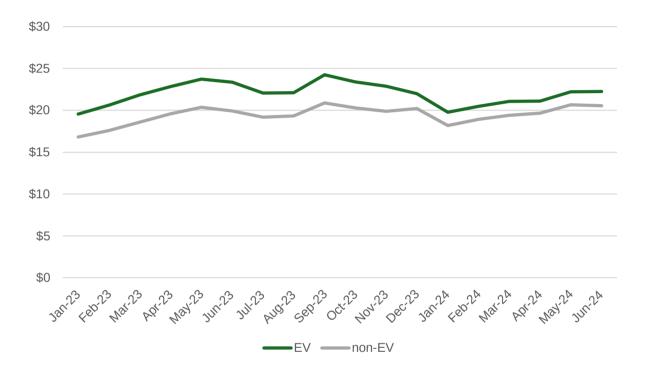


Figure 8: Average High-Volume FHV Driver Pay

Average vehicle trips and trip-miles by month

Among vehicles that performed a high-volume FHV trip in June 2024, EVs and gas-powered vehicles complete a similar number of trip-miles each month. Previously, EVs logged fewer trip-miles each month on average (Figure 9). This increase in monthly trip-miles by EVs may reflect more efficient charging behaviors by drivers as they learn how to better manage charging over time. Fast charging rates during warmer months and enhanced charger reliability as providers invest in system improvements amid the jump in charging demand may also impact vehicle utilization.

Figure 10 shows that the average number of monthly trips per active vehicle remains lower for EVs compared to other vehicles, though that gap has also narrowed. In recent months, EVs complete around four fewer trips per week than gaspowered vehicles. EVs are performing fewer trips overall but traveling a similar distance to gas-powered vehicles, which may be explained by the previous finding that the average EV trip is slightly longer.

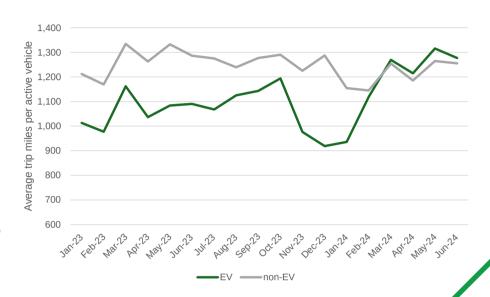


Figure 9: Average Monthly Trip Miles per High-Volume FHV

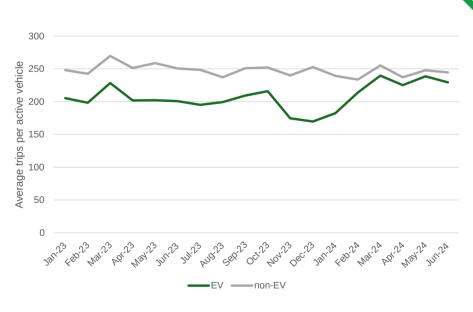


Figure 10: Average Monthly Trips per High-Volume FHV

Charging Development & Utilization

TLC has limited capacity to directly provide charging infrastructure beyond what can be installed at its facilities, such as the 30 fast chargers slated for installation as part of the redevelopment of the agency's Woodside inspection facility.³⁷ One goal of the Green Rides Initiative and the issuance of new EV-only licenses was to encourage private companies and government entities to invest in charging infrastructure. The increased demand for charging generated by for-hire EVs paired with the incentives discussed above is having its intended effect: charging providers are seeing consistently higher utilization across the network and moving forward with plans to expand the range of charging options available in the city.

Expansion of charging options

The market for EV charging includes several niches, with some providers specializing in the development of public fast-charger hubs and others working to build out Level 2 options at the curb. In New York, large private firms like Revel and Tesla and public agencies like NYPA and Port Authority have invested heavily in fast charging. NYC DOT has also been investing in charging infrastructure, including fast chargers at several of its municipal parking garages and is leading the expansion of the city's curbside Level 2 network.

Additionally, organizations such as NYCEDC are considering options for using off-street public property to support public charging throughout the city. NYCEDC recently unveiled plans to build 65 chargers, including 12 fast charging stations, on a site near JFK airport over the next three years.³⁸

New fast-charger hubs

Since TLC published Charged Up!, Revel, Tesla, NYC DOT, NYPA, and Gravity Mobility, among others, have all added or announced plans for new fast charging sites. In 2023, Revel opened its Long Island City superhub site—an ideal location considering the prominence of TLC-related businesses in that area and its proximity to the Central Business District—along with a smaller fast-charger site in Williamsburg, Brooklyn. Tesla opened a supercharger site in Coney Island, which serves a part of Brooklyn home to many TLC licensees and is easily accessed via the city's highway network. In the coming years, the two companies have plans to add over 200 stalls combined across more than a dozen sites in the city.³⁹ Of particular use to TLC drivers given the number of airport trips will be Revel's new hub adjacent to LaGuardia Airport, slated to open in 2025, which will be the largest charging site at an airport in the country.⁴⁰

In addition to private sector investments in fast charging, NYC DOT plans to open two fast charging sites before the end of 2024 and has three more slated for development in 2025. The first two sites include White Plains Road in the Bronx and Bensonhurst, Brooklyn. Additional sites in Queens Village, Clinton Hill in Brooklyn, and New Dorp in Staten Island, will follow. NYPA, which currently operates a fast-charger site at JFK Airport that is very popular with TLC drivers, has plans to add up to 13 more fast-charger hubs across the city as part of a joint effort with NYC DOT. Among NYPA's sites at the pre-construction stage is a planned hub at LaGuardia Airport. Many of the NYPA sites take advantage of utilities' make-ready programs, which provides incentives that cover between 50-100% of the site upgrades necessary for charger installation. The NYC Department of Citywide Administration Services (DCAS) has also made considerable investments in vehicle electrification and now has a fleet of over 5,200 plug-in vehicles and manages a charging network with over 2,000 ports, primarily for use by the municipal fleet. However, DCAS does offer public charging at 21 sites, including its fast-charger hubs at Randalls Island, Midland Beach, and Flushing Meadows Park Marina. 41 DCAS public sites provide more than 7,500 charging sessions to the public every month, and the Department is working to expand its publicly accessible sites.

In March 2024, Gravity Mobility opened the fastest EV chargers in the US open to the public. The chargers at the midtown Manhattan site can operate at 2,400 miles of range per hour or 200 miles in five minutes – perfect for drivers who want to charge mid-shift before continuing to pick up trips in the Central Business District.⁴²

^[39] Tesla correspondence with TLC, June 2024.

^{[40] &}quot;Revel Signs Lease to Build Nation's Largest Airport EV Fast-Charging Station by LaGuardia Airport," Metropolitan Airport News.

^{[41] &}quot;NYC Fleet Chargers General Public Access," NYC DCAS.

^{[42] &}quot;Gravity opens fastest EV charger in US to public in New York City," Reuters.

Expanding Level 2 charging at the curb

Advancements in battery and charging technologies are allowing fast chargers to deliver more power more efficiently. While this allows for higher throughput at high-powered hubs, a key to network reliability and accessibility is providing a range of charging options. Level 2 charging can be installed more quickly and cheaply than fast chargers, which have strict siting requirements and often call for significant utility upgrades. Level 2 chargers, which take several hours to deliver a full charge, can be used strategically to reduce strain on the electric grid at peak periods. They are particularly useful, for example, as an overnight charging option, which may be appealing for FHV drivers looking to maximize their time spent driving during the day and minimize time spent charging during their shift.

NYC DOT has led the development of curbside Level 2 charging across the city and is in the process of programming federal funding for a significant expansion and developing an approach for adding more charging in the coming years. NYC DOT is planning the locations of these new charging sites with a focus on equity, and particularly the needs of TLC-licensed drivers, incorporating driver residence data and driver input solicited in partnership with TLC. In August 2024, NYC DOT was awarded a \$15 million Charging and Fueling Infrastructure grant by the U.S. Department of Transportation to fund its expansion of curbside charging, which will add hundreds of plugs to the city's Level 2 network.⁴³

How TLC drivers are charging their vehicles

The steady growth of trips in for-hire EVs since late 2023 has allowed TLC and its partners to better understand drivers' charging patterns and areas of high and low charger utilization. In addition to the data generated by trips and drivers' daily sessions on platforms like Uber and Lyft, TLC has surveyed drivers and collected data from charging providers to analyze how, where, and when its licensees are charging their vehicles.

As drivers who applied for new EV-only licenses visited the agency's vehicle inspection facility in Woodside, Queens, the TLC Safety and Emissions team began surveying vehicle owners to gauge their charging plans. Asked whether they plan to charge their vehicle at home or at a public charging facility, about one-third of the more than 1,800 drivers surveyed said they would primarily charge at home. This compares to the 64% of drivers who planned to use public charging and around 2% who reported not knowing how they would charge their vehicle. About half of drivers reported a preference for fast chargers compared to one-quarter for Level 2. More than 10% said they were unfamiliar with the different levels of charging available.

Like New Yorkers in general, many TLC drivers live in multi-family buildings in dense neighborhoods where off-street parking is either unavailable or expensive. The survey revealed that more drivers than expected can charge at home. A possible explanation for the significant share of drivers that planned to charge at home is that those with access to off-street parking were disproportionally likely to purchase an EV when given the opportunity compared to those without such access. For charging providers, rather than broadly targeting parts of the city home to many TLC drivers, it may be necessary to investigate the prevalence of at-home charging within specific neighborhoods when making decisions about where to build new public chargers.

Operational data reveals patterns in driver charging behavior

In addition to the survey, TLC's outreach efforts provided insights into drivers' charging patterns. One such insight is that many drivers of for-hire EVs prefer to charge before or after their shift, as opposed to stopping mid-shift to top up their battery. TLC confirmed this trend using "breadcrumb" data, which reports vehicle location while a high-volume FHV driver is on-shift. Figure 11 maps vehicle location at the time each day when a driver logged on to start their first shift during June in 2024. The map includes an overlay of public fast-charging locations in the city.

Noticeable areas with a high density of drivers starting their day include the Hudson River crossings where drivers enter the city, as well as neighborhoods like Jackson Heights in Queens that are home to many FHV drivers. However, the map also highlights several hotspots in the immediate vicinity of the city's larger fast-charger hubs, such as at JFK Airport and the Queens Center Mall. These data confirm that many EV drivers log on and start their day after charging. While charging patterns partly reflect the distribution of the fast-charger network today, this finding still challenges prior expectations that drivers will want to charge mid-shift and that charging site selection should therefore prioritize areas like the central business district with high trip activity. Sites located along key arteries linking Manhattan to parts of the city—and the region—where most drivers live may enable the pre- and post-shift charging that drivers seem to prefer.

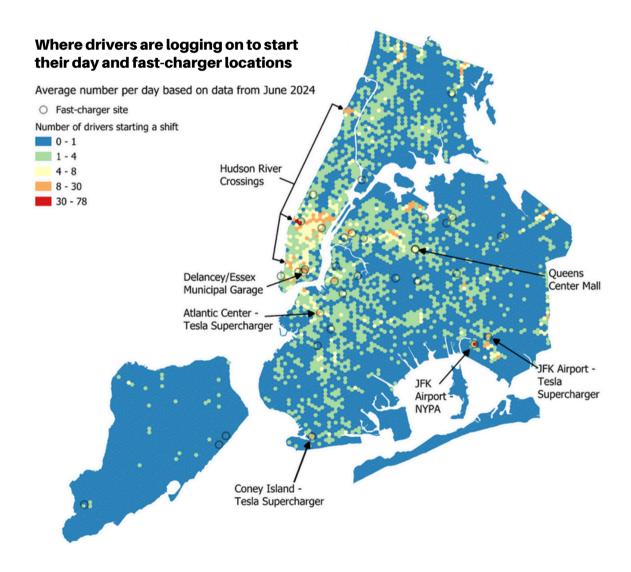


Figure 11: High-Volume For-Hire EV Driver Location at Shift Start and Charging Locations

Charger utilization data shows rapid growth in charging demand

One of the benefits of establishing clear targets for electrifying the for-hire vehicle fleet is that it signals sustained demand for charging which, as discussed in the previous section, can generate investment in infrastructure. With the help of charging providers, TLC analyzed changes in charging demand since Green Rides was announced. Utilization of EV charging can be measured several ways – it may be based on the amount of electricity dispensed by each charging stall, the number of charging sessions completed at a stall each day, or the amount of time a charger is plugged in. Regardless of how utilization is measured, though, the takeaway in New York over the last year is the same: since TLC announced Green Rides and began issuing EV-only licenses, the city's charging infrastructure is more highly utilized than ever. This is true across the fast-charging networks of Revel, NYPA, and Tesla, as well as DOT's extensive curbside Level 2 network.

Among the most popular providers of fast charging for TLC licensees discussed above, Revel has seen monthly charging sessions on its public network grow by 800% since September 2023. At Across its New York Supercharger network, Tesla has seen the average number of daily charging sessions per stall double compared to September 2023. The share of utilization from for-hire vehicles at Tesla hubs has increased threefold from 20% to 60% over that same period. NYPA is also seeing consistently higher utilization: at the end of the first quarter of 2024, NYPA's JFK fast charging site was regularly delivering more than 200 charging sessions per day, a benchmark that had previously been surpassed only once before. Similarly, starting in March 2024, NYC DOT reports more than 200 charging sessions per day at its fast charging sites.

Utilization of NYC DOT's curbside charging network has increased markedly over the last year, particularly in neighborhoods where many TLC drivers live. For example, NYC DOT reported that one highly utilized charging site in Jackson Heights, Queens, is plugged into a vehicle 98% of the time. System-wide utilization for the curbside chargers in May 2024 was 70%, almost double the average utilization of the curbside network in May 2023. While utilization of the NYC DOT network was growing steadily throughout the second half of 2023, the most significant increases coincided with TLC issuing new EV licenses in late 2023 and early 2024 and utilization has remained elevated ever since.

While higher utilization is a good thing, particularly when it is distributed throughout the network, congestion can become an issue when utilization is too high. At times over the last several months, some charging sites have demonstrated the negative impacts of very high utilization: long lines and overworked equipment. The charging providers TLC interviewed for this report expect that, as the network expands and charging is distributed across a wider array of sites, utilization at the most popular sites will begin to fall and then stabilize. TLC will continue monitoring utilization trends as its partners pursue a balance between high usage and reliable availability.

[48] Ibid.

Challenges and lessons learned from the EV rollout

By establishing progressive targets for the share of high-volume trips completed in a WAV or EV, the Green Rides Initiative envisioned an aggressive but realistic transition across the TLC fleet. However, as discussed in previous sections of this report, the rush on EV-only licenses in November 2023 rapidly accelerated the timeline. While getting more EVs on the road sooner meant hitting transition targets years ahead of schedule, it also highlighted challenges that span from driver education and communications issues to questions of infrastructure funding and site development.

Closing charging gaps across the five boroughs

One of the more immediate challenges TLC licensees faced after licensing their EV was charging availability. While the years leading up to Green Rides saw the steady deployment of charging infrastructure, gaps in the network remained. For example, when TLC's new EV drivers started providing trips in early 2024, there was only one fast charger in the Bronx, a borough home to nearly a fifth of TLC licensees. With many needing to crisscross the city in search of charging as they became familiar with their options and needs, drivers often faced congestion and lines at key charging stations. These issues were compounded by the timing of many new EVs hitting the road during the colder months when both vehicle and charging performance tends to be lower. A particularly cold stretch of days in January 2024 witnessed unprecedented lines at the city's most popular charging stations.

TLC and its partners sought to address these roadblocks where possible while planning for a future of abundant, accessible charging. Many of the near-term strategies for reducing charging congestion relied on better communication with drivers. TLC developed and shared resources to help drivers have a better understanding of the range of charging options available and worked with private partners to direct licensees toward hubs with spare charging capacity. Charging companies have also provided more guidance to drivers on charging behavior, such as Tesla implementing congestion fees for charging above 80% when the charging site is busy or NYPA posting signage encouraging users to not overcharge their vehicle. TLC also provided data that is key to developing charger locations such as aggregated driver residence data and information on high-volume trip locations.

As drivers have gotten better at managing their charging needs and charging availability and reliability has improved, congestion at charging sites has fallen to a more manageable level. However, based on analysis by public sector partners like NYC DOT and private infrastructure providers' own performance indicators, there remains a high need for more charging and the long development process continues to be a hurdle. Stronger collaboration between utilities, developers, landowners, and builders is needed to keep up with demand, even as more charging comes online.

The role of Level 2 charging in meeting the industry's charging needs

Both fast charging and Level 2 charging play important roles in catering to EV owners. Fast chargers offer rapid replenishment of battery power, which can be ideal for topping up a battery before starting or after ending a shift or charging mid-shift, whereas Level 2 chargers provide a reliable option for overnight or off-peak periods when drivers have more time to charge.

There is interest among partners in targeting investments in Level 2 charging to neighborhoods with a high density of TLC drivers, which would enable overnight charging at the curb and at easily accessible parking facilities. Expanding Level 2 charging in this way would reduce strain on fast-charger hubs. TLC has shared more granular data with NYC DOT for their Level 2 site planning and released a public tool through its online dashboard to facilitate this planning that includes maps like a more detailed, interactive version of the one featured above.⁴⁹

Fast chargers at airports have become critical hubs in the charging system.

Because TLC drivers are routinely picking up or dropping off passengers at the city's airports, EV chargers at those locations—developed by the Port Authority and NYPA—were destined to play an important role in facilitating the transition of TLC-licensed vehicles to EVs. With several of the city's public fast chargers concentrated around John F. Kennedy International Airport, the airport has emerged as a charging location of choice for FHV drivers, many of whom choose to start or end a shift there. While this demonstrates the importance of airport charging, the still-limited alternative charging options has led to very high utilization at airport chargers which has strained the capacity and equipment at those sites. The Port Authority, NYPA, private charging companies, and other public entities like NYCEDC are working expediently to get more charging built at the region's airports, though these sites often present unique complications around issues like utility upgrades and power sharing for airport operations. Additional fast-charging sites throughout the city will also help take the strain off airport chargers.

Conclusion:

TLC's next steps for encouraging electrification & reducing emissions

TLC is already seeing exciting progress toward the electrification and accessibility goals established through the Green Rides Initiative, with the share of high-volume FHV trips completed in EVs or WAVs increasing dramatically compared to just a few years ago.

As of August 2024, almost 20% of high-volume FHV trips were conducted in either an EV or WAV, far ahead of the year's goal of 5%. But Green Rides is just getting started – TLC will continue working with industry and public sector partners to encourage electrification and reduce emissions, improve accessibility, and model a collaborative and data-driven approach to regulating for-hire vehicles. The following are areas where the agency believes it can have the most impact in advancing these aims.

Supporting EV drivers and convening partners within and beyond the FHV industry

The success of TLC's policy goals depends on drivers. TLC will continue engaging drivers to understand the challenges presented by the transition to EVs, such as the cost of vehicles and availability of charging infrastructure. TLC staff will continue working with public agencies like DOT, DCAS, NYCEDC, the Port Authority and NYPA, as well as private sector partners like Con Edison and Revel on publicly available charging infrastructure and incentives for TLC drivers. Doing so will help ensure drivers reap the benefits that come with electrification.



Making more data and analysis publicly available

A wide range of organizations have expressed interest in using TLC's data to answer pressing questions for the EV transition, such as where to site charging infrastructure. The agency will continue its work to make more data available. TLC has already added EV and WAV trip data to its interactive data dashboard, the TLC Factbook,⁵⁰ and with this report has added more granular data on driver residence through an interactive map. TLC will explore additional expansions of the Factbook so that those interested in using TLC data to inform infrastructure decisions can do so easily.

TLC will continue analyzing data to understand how EV adoption is changing the industry and to track progress toward the Green Rides targets. Monitoring trends in accessible vehicle licensing and emissions savings will be especially important as a larger share of the FHV fleet is electrified. TLC is exploring ways to continue improving WAV service citywide, including by implementing stricter wait-time benchmarks for accessible for-hire service and improving data reporting on the experience of wheelchair users across the fleet.

Pursuing a more holistic approach to emission reduction

The electrification of TLC vehicles is good climate policy because the TLC-licensed fleet is so highly utilized. Because they spend more time on the road completing trips, electrifying FHVs and taxis has a much greater impact on emissions than electrifying personal vehicles. TLC will continue to explore ways to encourage electrification in other parts of the industry, including the city's yellow taxicabs.

However, a more holistic view on the role of TLC-regulated industries in reducing the carbon intensity of the mobility system may reveal other opportunities for curbing emissions. TLC will continue to explore ways to encourage the more efficient operation of TLC-licensed vehicles and reduce overall vehicle miles traveled, including through vehicle utilization standards to reduce emissions stemming from time spent driving without a passenger, limiting the addition of new drivers and vehicles, and incentivizing shared rides after their decimation during the coronavirus pandemic.

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